

Liu et al. App. No.10/809,254

G.A.U. 3747

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (original) A method of operating a compression ignition engine comprising:

processing certain data to select one of plural fueling modes for operating the engine, and

a) when the result of the processing selects a first fueling mode, fueling the engine during an engine cycle to create a substantially homogeneous air-fuel charge within one or more combustion chambers and compressing the charge to auto-ignition without introducing any additional fuel after auto-ignition, and

b) when the result of the processing selects a second fueling mode, fueling the engine during an engine cycle to create a substantially homogeneous air-fuel charge within the one or more combustion chambers, compressing the charge to auto-ignition, and introducing more fuel after auto-ignition to provide additional combustion.

2. (original) A method as set forth in Claim 1 wherein the step of processing certain data to select one of plural fueling modes for operating the engine comprises processing data indicative of engine load.

Liu et al. App. No.10/809,254

G.A.U. 3747

3. (original) A method as set forth in Claim 2 wherein the step of processing certain data to select one of plural fueling modes for operating the engine comprises processing data indicative of engine speed.

4. (original) A method as set forth in Claim 1 wherein in a graph of engine speed vs. engine load whose origin corresponds to zero speed and zero load, step a) occurs at engine speeds and loads within a first zone of the graph that bounds the origin, and step b) occurs at engine speeds and loads within a second zone that bounds the first zone.

5. (original) A method as set forth in Claim 1 wherein the step b) comprises providing a dwell between the step of fueling the engine to create a substantially homogeneous air-fuel charge and the step of introducing more fuel after auto-ignition of that charge.

6. (original) A method as set forth in Claim 1 wherein in the second fueling mode, the step of fueling the engine to create a substantially homogeneous air-fuel charge and the step of introducing more fuel both comprise injecting fuel by a fuel injection system, with the injection pressure that creates a substantially homogeneous air-fuel charge being at least as great as the injection pressure that introduces more fuel.

Liu et al. App. No.10/809,254

G.A.U. 3747

7. (original) A compression ignition engine comprising:

- a control system for processing data;
- one or more combustion chambers; and
- a fueling system for injecting fuel into the one or more combustion chambers;

wherein the control system controls the fueling system using a result of the processing of certain data by the control system to select one of plural fueling modes for operating the engine such that a) when the result of the processing selects a first fueling mode, the engine is fueled during an engine cycle to create a substantially homogeneous air-fuel charge within one or more combustion chambers that is compressed to auto-ignition, with no more fuel being introduced after auto-ignition, and b) when the result of the processing selects a second fueling mode, the engine is fueled during an engine cycle to create a substantially homogeneous air-fuel charge within the one or more combustion chambers that is compressed to auto-ignition, after which more fuel is introduced to provide additional combustion.

Liu et al. App. No.10/809,254

G.A.U. 3747

8. (original) An engine as set forth in Claim 7 wherein the certain data comprises data indicative of engine load.

9. (original) An engine as set forth in Claim 8 wherein the certain data comprises data indicative of engine speed.

10. (original) An engine as set forth in Claim 7 wherein in a graph of engine speed vs. engine load whose origin corresponds to zero speed and zero load, the first fueling mode occurs at engine speeds and loads within a first zone of the graph that bounds the origin, and the second fueling mode occurs at engine speeds and loads within a second zone that bounds the first zone.

11. (original) An engine as set forth in Claim 7 wherein in the second fueling mode, the control system provides a dwell between the creation of a substantially homogeneous combustible charge within the one or more combustion chambers and the injection of more fuel into the one or more combustion chambers.

12. (original) An engine as set forth in Claim 7 wherein in the second fueling mode, fuel is introduced by fuel injection both before and after auto-ignition, with injection pressure before auto-ignition being at least as great as injection pressure after auto-ignition.

13. - 20. (currently cancelled)